

★ ★ BENCHMARKS ★ ★

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THE COMPUTING CENTER GOES THROUGH SOME CHANGES

The past summer has been a period of transition for the NTSU Computing Center. During the weekend of May 23, 1980, installation of our new mainframe, a National Advanced System AS/5000 four megabyte CPU, was completed.

The AS/5000 is an IBM-compatible central processing unit rated superior to an IBM 3031. The AS/5000 processed the NTSU benchmark jobstream (a measure of overall performance on the current NTSU job mix) 3.9 times faster than our old IBM 360/50. CPU times for individual jobs ranged from 6.0 to 9.6 times faster on the AS/5000 than on the IBM 360/50.

In addition to the new mainframe, a 3.5 billion byte disk storage subsystem configured to provide two access paths to each disk drive to improve performance and reliability was installed. July 18, 1980, marked the cutover from the old MVT/HASP operating system to release 21.8F production MVT/HASP operating system with National Advanced Systems (NAS) Device Support Extended (DSX) to support the new 3330/3350 compatible disk drives.

Academic disk storage is calculated to be, initially, 1.1 billion bytes. This is 4.7 times the amount of storage that was available on the 360/50, and approximately 36 times the amount of storage available on the HP-2000.

The impact of all these changes on the average computer user, with respect to job preparation and submission, is minimal. The only changes which a user may have to make would be with regard to references to specific disk drives (See "The New 3330/3350 Compatible Disk Drives - How 'The Change' Can Effect You" in this issue.) Otherwise unless decreased turnaround time causes your head to swim, the metamorphosis should provide painless, if not pleasurable, hours of computing.

FALL COMPUTING HOURS

The computer room, student/faculty programming and keypunch area, and dispatch desk, which are all in the Computing Center (Information Science Building), will continue to be open twenty-four hours a day from 7:30 a.m. Monday through midnight Saturday, and from noon to midnight Sunday, when school is in session.

The Business Administration Building Computing Access Facility will open from 7:30 a.m. to midnight Monday through Saturday, and noon to midnight Sunday, when school is in session. The Computing Center is prepared to reschedule the closing of the B.A. Access Facility during peak loads.

The first step in becoming a computer user at NTSU is to "get a number." Access to the AS/5000 computer and/or related services provided by the Computing Center staff is gained by attaining authorization from the budget authority of the account to which charges are to be made (i.e., department head.) This may be accomplished in several ways, all of which require completion of the NTSU Computing Center Project Number Request Form obtained from the Computing Center. One may (a) go directly to a department head, (b) go through another faculty member, who goes to a department head, or (c) enroll in a class that requires utilization of the AS/5000 (equivalent to b.) Once account authorization is attained, the prospective user will be assigned a PROJECT NUMBER by the Computing Center. It is, of course, the responsibility of the user to protect his/her project number from "pirates" who may conspire to steal computer time. Failure to do so could result in the suspension of the user's account authorization.

In order to obtain a User ID and Password for the Hewlett-Packard (HP) Timeshare System, the NTSU HP Timesharing Service ID Request Form, available at the Computing Center, must be completed for the issuance of ID codes and passwords. Faculty member approval of the request form is required. As with the AS/5000 project number, the user himself/herself is responsible for the security of his/her ID code and password.

Access to the new McGill University Shared Interactive Computing (M.U.S.I.C.) will be available on a limited basis this semester. To obtain an ID, the user must first follow the above procedure for access to the AS/5000. Qualified users will then be required to complete a M.U.S.I.C. Timeshare Service ID Request Form, available at the Computing Center. For further information on M.U.S.I.C., see "M.U.S.I.C." this issue.

YOUR TIME IS UP

September was the month for renewal. If you have had a project number for the AS/5000 and have not already renewed it, it is no longer valid. This is also true, as of September 30, 1980, for the Hewlett Packard ID's. If you wish to retain reserved tape volumes for the current year, please come by the Dispatch Desk prior to October 15. Renewal of AS/5000 project numbers and HP/2000 ID's is accomplished in the same manner as attaining one for the first time (See "So You Want to Compute" in this issue.)

SERVICES AVAILABLE TO USERS OF THE NTSU COMPUTING FACILITIES

Old friends of the Computing Center should note that some names have been changed and some services added, so read on. To obtain information about any of the services listed below, call 788-2324 or come by the Information Sciences Building (ISB) Room 119.

Information and Project Numbers can be obtained from Sandy Franklin or Sue Anderson in the Computing Center Reception Area, ISB 119.

Test Scoring and Analysis is also available from Sue Anderson or Sandy Franklin.

Newsletter Questions/Contributions/etc. should be directed to Claudia Putnam.

Statistical Programming is handled by Claudia Putnam and George Morrow for faculty members and graduate students. Statistical packages supported are SPSS, SAS, and the NTSU Statistical Program Library.

Research Programming for graduate students and faculty members is provided by James Cook and Abdi and Mohamad Salashoor.

Non-Research Student Programming Problems are handled by the student consultants from the Computer Science Department who can be found in ISB 134A near dispatch and the user keypunch area. Student consulting provided by the College of Business is available at the BA Computing Access Facility.

JCL and Debugging Problems should be directed to Abdi or Mohamad Salashoor.

Pre-Research Counseling, Including Survey Instrument Design, is provided by Claudia Putnam and George Morrow.

Keypunch Requests and Questions Regarding Layout of Keypunch Sheets should be directed to Betty Grise, ISB 227.

Academic Timesharing Information and/or Problems. HP2000 information and problems, including terminals, are handled by James Cook. AS/5000 M.U.S.I.C. (McGill University for Interactive Computing) information and problems are handled by Abdi and Mohamad Salashoor.

Administrative Applications are handled by Coy Hoggard.

AS/5000 Computer Hardware/Software/Billing Problems should be referred to Sandy Franklin.

Job Dispatch and Retrieval is handled by the I/O Coordinators in Dispatch.

SOFTWARE - WHAT WE HAVE AND WHAT WE SUPPORT

The following table is a "Software Support Key" designed to inform users of the level of support the Computing Center offers for maintenance, documentation, and consultation with regard to the software available on the AS/5000 and the HP2000/40. As stated, letters in parentheses denote abbreviation for each category.

Software Support Key**

	FULL (F)	PARTIAL (P)	MINIMAL (M)	NONE (N)
Maintenance (MT)	a. New versions with major improvements installed as soon as possible. b. Bugs fixed by CCTR Staff or reported to vendor as soon as possible. c. Vendor committed to fixing bugs.	a. New versions with major improvements installed as staff is available. b. Known errors may exist. c. Vendor may not be committed to fixing bugs.	a. New versions if available installed if no major mods required. b. Known errors may remain. c. No guarantee of support from vendor.	No Maintenance
Documentation (D)	Full documentation from vendor or local source.	Documentation from vendor or local source may be inaccurate or incomplete.	Local documentation only on access. Other documentation may be available.	No new documentation.
Consultation (C)	Consultants familiar with use and problems of processor.	Consultants have information on access, but more than that depends upon available staff.	Consultants have information on access only.	Consulting help may not be available.

** Letters in parenthesis denote abbreviations for each category.

AS/5000 SOFTWARE

PROCESSOR/LIBRARY	SUPPORT			SOURCE	COMMENT
	MT	D	C		
VM/370	F	F	F	IBM/NAS	Virtural Machine Operating System
OS/MVT	F	F	F	IBM/NAS	Release 21.8F Operating System
MUSIC	F	F	F	IBM/McGill University	McGill University System Interactive Computing
HASP	F	F	F	IBM/NAS	Version 4.1 (Spooling Processor)
CICS	F	F	F	IBM	Version 2.3 (Teleprocessing Monitor)
FORTTRAN IV	P	F	F	IBM	Version G
FORTTRAN IV	P	F	F	IBM	Version H
FORTTRAN IV	F	F	F	IBM	Version G1
WATFIV	P	P	F	University of Waterloo	In-core FORTRAN Lang. Trans.
COBOL	P	F	F	IBM	ANS Version 2
COBOL	P	F	F	IBM	ANS Version 4 (on order)
WATBOL	F	F	F	University of Waterloo	In-core ANS COBOL Lang. Trans.
PL/1	P	F	F	IBM	Version F
PL/1	F	F	F	IBM	Optimizing Compiler
PL/C	P	F	F	Cornell University	In-core PL/1 Lang. Trans.
FORMAC	P	F	M	IBM Employee Contributed	PL/1 F SUPERSET
Assembler	P	F	F	IBM	Version F
ALGOL	P	F	P	IBM	Version F
RPG	P	F	P	IBM	360 Version
GPSS	P	F	M	IBM	360 Version
SIMSCRIPT	F	F	M	Consolidated Analysis	Version II.5
SNOBOL	P	F	P	Bell Telephone	Version 4
SPITBOL	P	F	P	Illinois Insti. Technology	In-core SNOBOL4 Lang. Trans.
NTSU STATPAK	F	F	F	NTSU	
SPSS	F	F	F	University of Chicago	Release 8
SAS	F	F	F	SAS Institute Inc.	Release 79.3A Statistical Analysis System
OSIRIS	P	F	M	University of Michigan	Version III
BMD	N	P	P	UCLA	Biomedical Stat Package
Misc. Prog. Library	F	F	F	NTSU	
Misc. Subroutines	F	F	F	NTSU	
OS Utilities	P	F	F	IBM	
CASORT	F	F	F	Computer Associates	Sort Utility
User Library	N	N	N	NTSU Users	Individual user programs which could benefit others.
Scientific Library	N	F	P	IBM	
FORMAT	P	F	M	IBM/Stanford	Release 5

** These compilers will be available with M.U.S.I.C.

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Documentation (D)	Full documentation from vendor or local source.	Documentation from vendor or local source may be inaccurate or incomplete.	Local documentation only on access. Other documentation may be available.	No new documentation.
Consultation (C)	Consultants familiar with use and problems of processor.	Consultants have information on access, but more than that depends upon available staff.	Consultants have information on access only.	Consulting help may not be available.

**Letters in parenthesis denote abbreviations for each category.

HEWLETT PACKARD 2000 MODEL 40 SOFTWARE

PROCESSOR/LIBRARY	SUPPORT			SOURCE	COMMENT
	MT	D	C		
SPSSHP	P	F	P	DePaul University	Statistical Package for the Social Sciences
BASIC	M	F	F	Hewlett Packard	Languages Translator
EDITOR	M	F	P	Hewlett Packard	
FCOPY	M	F	P	Hewlett Packard	File Copy Utility
CAI	M	F	M	Hewlett Packard	Instructional Dialogue Facility
FINDIT	P	F	P	Hewlett Packard	File Processing Package
SYSPDS	P	F	P	NTSU	Word Processing Package
HP Contributed Lib.	M	F	N	HP Users	
A900-Pseudo Lib.	N	F	N	NTSU Users	

NTSU COMPUTING CENTER GENERAL USAGE EQUIPMENT LIST
(BY LOCATION)

COMPUTING CENTER COMPUTER ROOM:

- 1 National Advanced Systems, Model AS/5000 Computer System with four megabytes of main memory.
 - 6 NAS 7350 Disk Storage Units and Control (1.9 billion bytes)
 - 8 NAS 7330-11 Disk Storage Units and Control (1.6 billion bytes)
 - 3 STC 3400 Tape Drives and Control (120-320 KBS, 800-1600 BPI)
 - 1 IBM 1403-N1 printer (1100 lpm)
 - 1 IBM 2540-1 Card Reader/Punch (1000/300 cpm)
 - 1 IBM 2821 Control Unit for 1403/2540
 - 2 IBM 3272-2 Terminal Control Units (64 synchronous lines)
 - 5 IBM 3277-2 CRT terminals
 - 1 Memorex 1270 Terminal Control Unit (8 synchronous and 16 asynchronous lines, 36 additional asynchronous to be installed)
 - 1 Documation 6501-IV Card Reader, 1000 cpm
 - 1 IBM 029-C22 Interpreting Card Punch
- 1 Hewlett Packard 2000 Access, Model 40, Timesharing Computer System.
 - 1 HP 2108A M/20 System Processor (64K)
 - 1 HP 2112A M/30 Communications Processor (64K)
 - 1 DEC LA36 Console Terminal (300 Baud)
 - 2 HP 7905A Disk Storage Units (29.5 million bytes)
 - 1 HP 12972A Tape Drive (1600 BPI, 72 KBS)
 - 1 HP 2748B Paper Tape Reader (8 level, 500 cps)
 - 2 HP 12920B Asynchronous Multiplexors (32 RS-232 Terminal Interface Parts)
 - 1 GTE T113 BDS Data Station (12 dial-up phone lines, 110-300 Baud)
 - 2 TI 745 Terminals (on Check-out Basis)

COMPUTING CENTER STUDENT KEYPUNCH ROOM:

- 15 IBM 029-A22 Card Punches
- 1 IBM 059-2 Card Verifier
- 1 LSI ADM3 Timesharing Terminal (2400 Baud, HP)
- 1 Alanthus 8400 Cassette I/O Unit
- 3 MIME II CRT Timesharing Terminals

COMPUTING CENTER RECEPTION AREA:

- 1 IBM 1230 Optical Mark Reader/Scorer
- 1 IBM 534 Card Punch Attachment for 1230

FACULTY/STAFF TERMINAL ROOM (ISB 229):

- 1 Diablo 1620 Timesharing Terminal (300 Baud)
- 2 IBM 3277 Compatible Terminals to be installed for use on AS/5000 (on order)

STUDENT TERMINAL ROOM (ISB 224):

- 4 DEC LA36 Timesharing Terminals (300 Baud, HP)
- 2 LSI ADM3 Timesharing Terminals (2400 Baud, HP)

MUSIC BUILDING (MU 1007):

- 1 DEC LA36 Timesharing Terminal (300 Baud)

BUSINESS ADMINISTRATION BUILDING:

- 1 Unitech UT-2 Remote Job Entry Processor BA 152
 - 1 Documation M400L Card Reader, 600 cpm
 - 2 Unitech 6444 Line Printers, 600 lpm
 - 1 Unitech KB-1 CRT System Console
- 3 IBM 029-A22 Card Punches BA 152
- 10 IBM 029-A22 Card Punches BA 151
- 1 DEC LA36 Timesharing Terminal (300 Baud) BA 154
- 16 MIME II CRT Timesharing Terminals to be installed for use on AS/5000
- 2 IBM 3277 Compatible Terminals to be installed for use on AS/5000
- 1 IBM 029-A22 Card Punch BA 256
- 1 DEC LA36 Timesharing Terminal BA 253

GENERAL ACADEMIC BUILDING:

- 1 DEC LA36 Timesharing Terminal (300 Baud) GAB 330D
- 16 ACT V CRT Timesharing Terminals to be installed for use on AS/5000
- 1 Remote Job Entry Station supporting one 600 cpm Reader and one 1000 lpm Line Printer has been ordered.
- 2 IBM 3277 Compatible Terminals to be installed for use on AS/5000

PHYSICS BUILDING:

- 1 IBM 029-A22 Card Punch
- 1 DEC LA36 Timesharing Terminal (300 Baud) PM 310
- 1 Calcomp 663 Plotter Physics B13 (Contact Dr. Jim Mackey in Physics about the software for the 663)

WOOTEN HALL:

- 1 IBM 029-A22 Card Punch
- 1 DEC LA36 Timesharing Terminal (300 Baud) WH 173

THE NEW 3330/3350 COMPATIBLE DISK DRIVES - HOW "THE CHANGE" CAN EFFECT YOU

Got an old card deck that ran okay for the past two years, and this semester your job is bombing for no apparent reason? Been running that same IBM Utility for three semesters with no hitches, and now nothing will make it work? Take a gander at your "UNIT=" parameter and/or your device type.

As of September 1, 1980, the 2314 disk drives are no longer with us. This means that:

- A. UNIT=2314 or any other parameter such as DISK must be changed to UNIT=SYSDA. One exception to this is for sort work data sets (SORTWK01, SORTWK02, etc.) in which UNIT=WORK should be used.
- B. The following volume serial numbers no longer exist: USRLIB, USRVOL, USRPAK, USRDSK, MFTRES, MFTLIB, MFTPAK, LODLIB, WRKPAK, DMNT00, DMNT01, DMNT02, DMNT03, WORK01, WORK02, COMSCI, SIMSCI, PHYSIC, PHYS02, ICPR01, ICPR02, TWU001, TWU002, PDI001, STRATA, DBMS01, DBMS02, RSRCH1, RSRCH2. Any job specifying any of these volumes must be changed in order for the jobs to run.

If the data set is temporary (exists only during job execution), simply remove the VOL=SER= parameter entirely (and change UNIT=SYSDA if necessary.) One 3330 and two 3350 disk drives are currently allocated to academic users. An additional 3350 will be allocated to support M.U.S.I.C. timeshare system (See "M.U.S.I.C." in this issue.) Academic support libraries (SPSS, SAS, OSIRIS, the user load library, the batch compiler data sets, the NTSU statistical libraries, etc.) have been moved to the 3330 pack.

THE FOLLOWING GUIDELINE SHOULD BE USED TO ALLOCATE DISK SPACE ON THE NEW DRIVES WHEN CREATING NEW DATA SETS.

<u>AREA</u>	<u>DEVICE TYPE</u>	<u>VOLUME SERIAL</u>
Instructional		
College of Business	3350	ACAD01
Arts and Sciences	3350	ACAD02
Other	3350	ACAD02
Research Funded Through Faculty Research	3330-1	ACAD00

IBM UTILITIES

Certain utility programs (IEHPROGM, IEHMOVE, IEHLIST, etc.) use control cards in which device type is required. In these cards, you must use the actual device type, not SYSDA. For example:

IEHLIST:

LISTPDS DSNAME=XXXXX,VOL=3350=YYYYYY

IEHMOVE:

COPY PDS=AAAAAA,TO=3330-1=BBBBBB,FROM=3330-1=CCCCCC

Note: For 3330 Disk Drives, you must use 3330-1.

In cases where a volume serial number is required for a scratch utility data set, the system residence pack, (SYSRES) may be used.

SPACE/BLOCKING

A blocksize of 7294 (7280 for card images), the maximum and most frequently used for 2314 disks, is a bad choice for either type of new drive. Significant space will be wasted on the new drives if this blocksize is used. The largest, best-blocksize that will efficiently fit on all three type disks (2314, 3330,3350) is the nearest multiple of record length (LRECL) not exceeding 6233. For example, use a blocksize of 6160 for 80 character card images and you will be able to store 77 cards on a 2314 track, 154 cards on a 3330 track, or 231 cards on a 3350 track. Use of a blocksize value near but less than 6233 for either 3330 or 3350 disk, rather than the maximum for each device, will allow the transfer of data between the different devices without changing the blocksizes.

Also for ease in using both disk device types, you should begin allocating disk space in units of blocks, rather than tracks or cylinders (NOTE: cylinders must be used for ISAM.) For example, to allocate space for 5000 card image records, use SPACE=(80,(5000,500),RLSE) rather than SPACE=(TRK,(33,4),RLSE) for 3330 or SPACE=(TRK,(22,3),RLSE) for 3350.

ISAM data sets must use cylinder allocations. Consideration should be given to differing number of tracks/cylinder for the different disk types (2314-20 TRKS/CYL, 3330-19 TRKS/CYL, 3350-30 TRKS/CYL) to obtain the proper amount of space required. See the "Computer Center Users" memo dated July 16, 1980, (available at dispatch) for a table of space capacity values for the 3330/3350 and 2314 disks.

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*           H P - 2 0 0 0           *
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ALL USERS SHOULD MAKE SURE AND READ THE LOG-ON MESSAGES - THEY MAY BE IMPORTANT!!!!

FALL BACKUP SCHEDULE

As in the past, daily backup of the HP will be done between 8 a.m. and 8:30 a.m., Monday through Friday. A weekly backup will be performed every Friday between the hours of 4 p.m. and 5 p.m., a departure from the procedure this past summer. Scheduled shutdowns may occur on weekends due to the continued software development being carried on by the Music Department. At least 48 hour advance notice of scheduled downtime for preventive maintenance and weekend software development will be provided via System Log-On Messages.

MINI-SEMINARS

This past summer, a series of single session mini-seminars was offered to HP-2000 users. They consisted of (1) "Getting Started on the HP-2000" (1 hour), (2) "Introduction to HP-2000 BASIC" (2 hours), and (3) "File Processing on the HP-2000" (2 hours). James Cook, the timeshare coordinator for the HP, would like some feedback with regard to the desirability of future seminars along this same line. Please call (817)788-2324 or write to: James Cook
NTSU Computing Center
NT Box 13495
Denton, TX 76203

HP/2000 USAGE STATISTICS SEPTEMBER 3, 1979 TO SEPTEMBER 1, 1980

Top Ten Academic Users - Total Number Terminal Hours

	<u>Department</u>	<u>Terminal Hours</u>	<u>Average Number Users</u>
1.	Business Administration	82,769.58	986
2.	Music	7,962.32	225
3.	Physics	6,780.79	87
4.	Computer Science	3,587.06	114
5.	Chemistry	1,767.81	50
6.	Mathematics	1,143.26	59
7.	Library Science	1,122.67	27
8.	Education	941.30	22
9.	Political Science	646.42	181
10.	Biology	323.11	14
TOTAL HP USAGE:		42,213.1	1,955

AS/5000 USAGE STATISTICS - SEPTEMBER 1, 1979 TO AUGUST 31, 1980

TOP TEN ACADEMIC USERS - DOLLAR AMOUNT FOR RESEARCH PROGRAMMING CHARGES

<u>ACCOUNT</u>	<u>CHARGES</u>
1. Department of Education	\$ 8,356.48
2. Psychology.	5,443.49
3. Basic Health Sciences	1,515.00
4. Accounting and Information Systems.	1,212.19
5. Professional Development Institute.	1,089.00
6. Music	1,072.50
7. School of Library and Information Science	751.00
8. Finance, Insurance, Real Estate and Law	731.99
9. Health, Physical Education and Recreation	695.99
10. Marketing and Business Education.	675.00

TOP TEN ACADEMIC USERS - DOLLAR AMOUNT FOR COMPUTER CHARGES

<u>ACCOUNT</u>	<u>CHARGES</u>
1. Accounting and Information Systems.	\$264,657.58
2. Computer Science.	185,856.97
3. Physics	58,850.10
4. Department of Education	22,487.51
5. Music	12,500.89
6. Management.	12,007.45
7. Psychology.	7,403.44
8. Political Science	5,468.42
9. Mathematics	4,973.13
10. Professional Development Institute.	4,318.31

TOP TEN ACADEMIC USERS - DOLLAR AMOUNT FOR TOTAL CHARGES*

<u>ACCOUNT</u>	<u>CHARGES</u>
1. Accounting and Information Systems.	\$271,446.62
2. Computer Science.	186,872.36
3. Physics	60,402.45
4. Department of Education	33,138.63
5. Psychology.	14,115.45
6. Music	13,896.37
7. Management.	13,734.03
8. Political Science	7,442.72
9. Professional Development Institute.	5,984.27
10. Sociology and Anthropology.	5,733.33

*Total Charges=Analyst + Programmer + Keypunch + Computer + Supplies + Other Charges

ACADEMIC USERS - TOTAL DOLLAR AMOUNT FOR THREE AREAS

	(1) Research Programmer	(2) Computer	(3) Total
Instructional Use	\$26,767.45	\$604,792.15	\$667,263.85
Faculty Research	\$ 5,879.07	\$ 72,333.25	\$ 87,217.19

INTERACTIVE COMPUTING ON AS/5000 THROUGH M.U.S.I.C.

M.U.S.I.C. (McGill University System for Interactive Computing) is a proven, high performance, interactive operating system that comes complete with a comprehensive package of programs and facilities designed to meet the varied needs of interactive computing.

The NTSU Computing Center supports the university through the use of two operating systems: MVT and M.U.S.I.C. Both operating systems share the AS/5000 through the facilities provided by VM/370. Most batch jobs are processed on the MVT system. Three printer and reader stations currently provide access to the MVT batch system with additional RJE equipment to be delivered this semester.

The M.U.S.I.C. system will be accessible through any one of 88 telecommunication ports. These include sixteen dial-up, asynchronous ports (available now), one IBM 3272 control unit supporting 32 dedicated, synchronous terminals (Telex TC-277 model), and 36 dedicated asynchronous ports.

M.U.S.I.C. can be used to submit batch jobs to MVT. The Job Control Language and data required by the program can be entered into a M.U.S.I.C. file, saved in the users' library, and submitted to MVT via the OSJE facility. In addition, M.U.S.I.C. can retrieve system output (print/punch) via the OSJR facility to be displayed at the terminal and/or routed to any MVT print/punch station.

Users will be able to compile and run jobs in an interactive mode for jobs written in FORTRAN, Version 4 COBOL, PL/I, VS BASIC, or WATBOL. Word processing is provided through SCRIPT. Two editors are provided in MUSIC, a line editor primarily for asynchronous terminals and a context editor primarily for synchronous terminals with limited applications on asynchronous terminals. STATPAK, an interactive statistical analysis package, allows students to experiment with different statistical procedures in a conversational mode.

Essential to the operation of a large interactive system are easy methods to control the facilities, particularly in the area of CPU and disk usage. We do this by assigning each user a code which contains a limit to the amount of CPU and disk storage that may be used. The CPU time can be defined to be different in prime and nonprime time periods. Users can change their own passwords and other non-critical items of their code record.

Each user must have a unique user identification code and password. To apply for a code, you must first complete a Computing Center Project Authorization Form with signatures of the budget authority (usually department chairman). Faculty may request ID's for each student in a class that has been approved for use of M.U.S.I.C. Project Authorization Forms and M.U.S.I.C. ID Request Forms are available at the Computing Center.

It is recommended that the current semester be used as an evaluation period for the M.U.S.I.C. timeshare system. Due to hardware delivery schedules and software implementation, it will be necessary to limit use of M.U.S.I.C. to faculty, staff, and selected advanced courses for the Fall semester. It is anticipated that M.U.S.I.C. will be able to support approximately 64 concurrent users on the AS/5000. Although this represents a significant number of users, it will not be sufficient to allow use of M.U.S.I.C. for introductory level courses.

For further information on M.U.S.I.C., see the User's Guide in the manual rack at the local student access area. Questions on M.U.S.I.C. should be directed to Abdi or Mohamad Salashoor (788-2324).

ASSISTANT DIRECTOR OF ACADEMIC COMPUTING RESIGNS

Douglas Lillard, Assistant Director of Academic Computing since 1978, has resigned from his position effective October 10, 1980. He plans to go into business for himself in his hometown of Gainesville. Doug has been with the Computing Center since 1973 and was originally employed as a research programmer. His departure will mean quite a loss for NTSU, the Computing Center, and those people who have worked closely with him through the years. He is always busy, but never too busy to help someone with a problem, and he always does so with a smile. The Computing Center staff wishes the best of luck to Doug in his new endeavors.

MEMORY NO LONGER A FACTOR IN JOB CLASS SELECTION

Memory requirements will no longer be used to determine job class. This means that CLASS=A can be used by any job that utilizes no devices, CLASS=B can be used by any job that requires (1) tape mount, CLASS=D, I, or G for any job that requires two (2) tape mounts, and CLASS=C for any job that requires three (3) tape mounts. For example: An SPSS job with no devices that used to run as CLASS=D because of core restrictions can now be run as CLASS=A. Note that there is no change in the time/lines restriction, however.

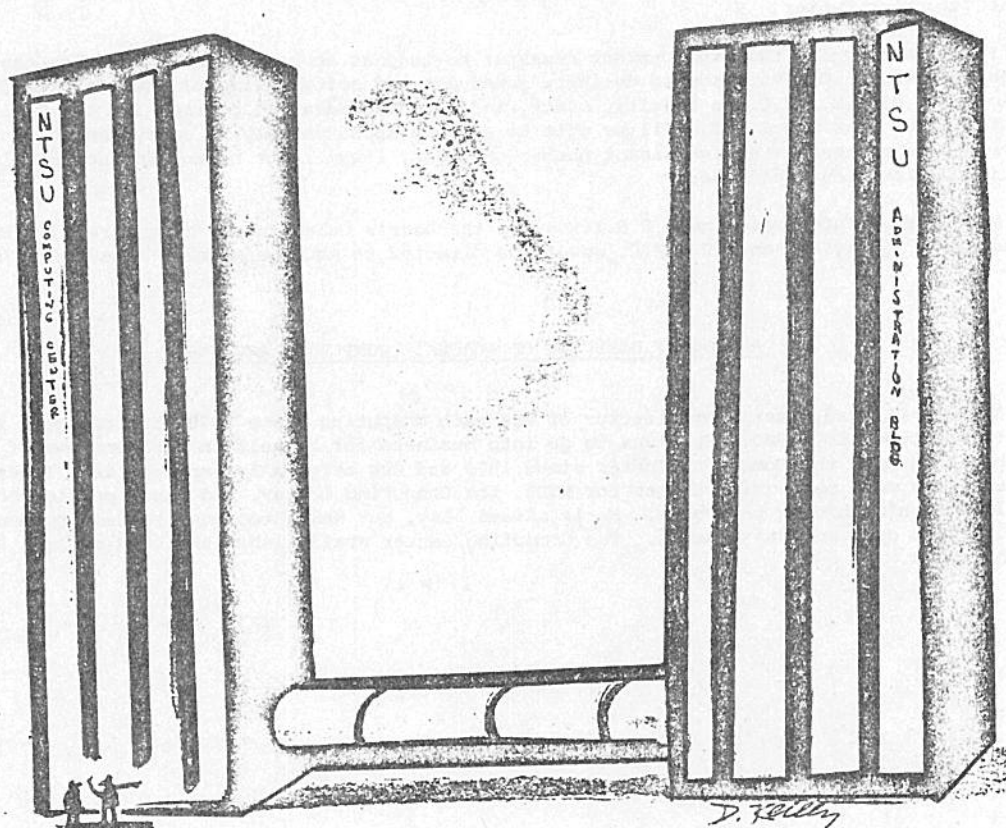
DATA ENTRY SERVICES

Walking down the hall in the Computing Center offices, one may get the impression that the staff consists almost entirely of programmer-type people. This is not completely true, however. While there are a lot of programmer-types on the payroll, the Computing Center would not be complete without the services of many other people including the one part-time and eight full-time data entry operators who reside "upstairs" in ISB 227. These fine people do the keypunching work for all the programmers within the Computing Center as well as "outside" users from the general academic community of NTSU. According to Betty Grise, Data Entry Supervisor, if a person is a graduate student, faculty, and/or staff member, and has a valid project number (see "So You Want To Compute. . ." and "Renewal Of Project Numbers" in this issue), (s)he has the privilege of utilizing the services of the data entry operators.

Recently, data entry has upgraded its keypunch machines to Sperry Univac 1810's. These machines, according to Mrs. Grise, are greatly superior to the old IBM 029 keypunches (like the ones in the student keypunch areas.) For one thing, the 029 keypunches required a separate verifier (an 059) to "check" the previously punched cards for possible keypunch errors, while the 1810 can do it all, simply by flipping a switch. Also, according to the Sperry Univac 1810 manual, the present machines contain a microprocessor and ". . . the required microprograms for processing standard 80 column cards. Sufficient storage and accumulating capabilities permit certain computations to be performed thereby increasing card processing efficiency." Definitely a far cry from the IBM 029's!

All in all, the 1810's provide more efficient, (virtually) error free keypunching capabilities to the data entry operators. This, in turn, has increased the quality of service they are able to give to you, the academic community of NTSU.

COMPUTER HUMOR



"Basically, we generate the data over here and they stockpile it over there."

REMOTE JOB ENTRY (RJE) OPERATIONS: SECURE JOBS

Rabon Sanders, the Computer Operations Manager, would like to remind all users of the RJE facilities in BA 152 that secured output should be requested only when absolutely necessary. This will help to keep pileups at the dispatch counter to a minimum, and increase the efficiency of the dispatch assistants by eliminating some time consuming filing and retrieving.

FROM OUR USERS: "ODE FROM A FRUSTRATED NEOPHYTE"
by Curtis Copeland

*There he stands
Printout in hand
Leaning on your office door.*

*"Can you help?" he cries
And she replies
This once, but nevermore.*

*The printout she faces,
The carpet he paces,
The error she finally discovers.*

*Once more he sets off
With a wheeze and a cough
Saying something about the computer's mother.*

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SAS SUPPLEMENTAL LIBRARY

It is now possible to access procedures referenced in the SAS SUPPLEMENTARY LIBRARY USER'S GUIDE by simply calling for them. For example:

```

// EXEC SAS
DATA;
INPUT A B C D;
CARDS;
    data
PROC PREDICT;

```

SAS FOR CREDIT

Dr. John Rodgers, Institute of Applied Sciences, plans to offer a seminar in the Spring on the use of SAS for the manipulation and analysis of data. The course will be a beginning course and will require no prior knowledge of computing. Dr. Rodgers is currently teaching the seminar under BIOLOGY 601.003. Anyone interested in the Spring seminar should contact Dr. Rodgers through the Institute of Applied Sciences, telephone, 788-2694.

COLLEGE OF BUSINESS AND COMPUTER SCIENCE COMPUTING CENTERS ESTABLISHED

Two additional computer facilities are now available on campus. Texas Instruments provided NTSU with two TI990 minicomputer systems and twenty-four TI micro computers. The Computing Center is providing maintenance and operation funding and the College of Business and the Computer Science Department are providing Departmental Computing Center Managers and student consultant staffing. The Computing Center will provide remote job entry equipment and operations staff, plus an additional sixteen terminals at each facility.

These cooperative efforts should provide all NTSU students and faculty with a wide range of computing equipment and services that would not be possible from any single computer facility or system. Both facilities should be in full operation by the start of the Spring semester.

NEWS FROM COLLEGE OF BUSINESS COMPUTING CENTER . . .

The Computing Center staff would like to welcome Mr. Cengiz Capan, College of Business Departmental Computing Center Manager to NTSU. In addition to his duties at the College of Business Computing Center, Mr. Capan will be teaching in the Accounting and Information Systems department. We look forward to working with Mr. Capan and expect to gain through exchange of ideas and problems. The following article was contributed by Mr. Capan.

The College of Business has a new computer. It is a TI-990/10 mini-computer and is located in Room 154 in the Business Administration Building. The objective of the College of Business Computing Center is to promote the use of the computers as a decision making tool. In particular, an emphasis is placed on an interactive approach to computer assisted decision making in all business disciplines. The operating system of the TI-990/10 is a DX10 operating system. DX10 is a general purpose, multitasking operating system designed to operate with TI 990/10 and 990/12 minicomputers using the memory mapping feature. DX10 is a versatile operating system capable of supporting a wide range of commercial and industrial applications.

It is a disk based operating system featuring a powerful file management package including multi-key indexed files. DX10 is interactively oriented, although a batch mode is also supported. It is also a multi-terminal system capable of making each of several users appear to have exclusive control of the system. DX10 may also be configured at System Generation (SYSGEN) time to support specialized real-time applications.

In addition to providing multi-terminal application support, DX10 features advanced program development support. A text editor is provided to enter source programs or data into the system. A Macro Assembler is provided for assembly language programs. Higher level language support includes FORTRAN, COBOL, RPGII, PASCAL, and BASIC. A Link Editor and extended debugging facilities are provided to further support program development. A variety of utility programs, a data base management package, and comprehensive Sort/Merge package are also supported.

The hardware configuration of the TI-990/10 include:

- A. 320K bytes of memory.
- B. High speed disk with 400 megabytes of storage.
- C. Floppy disk.
- D. Line printer (600 lines per minute).
- E. Character printer (120 characters per second).
- F. 8 video terminals.
- G. Communication interface to AS/5000 (soon).

INDEX TO PAST ISSUES

In order to utilize BENCHMARKS to its fullest capacity and avoid redundancies, an index of all previous issues will henceforth be included in each new publication. Individuals can then use this as a guide to refer back to articles on topics that pertain to their interests.

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* BENCHMARKS is a semesterly publication of the NTSU Computing Center. Reader/user feedback is
* encouraged, so send all letters, suggestions, etc., to: NTSU Computing Center
*                                     NT Box 13495
*                                     Denton, TX 76203
*
* Claudia Putnam . . . . . BENCHMARKS Editor
*
* Richard Harris . . . . . Director of Computer Systems*
*
* Douglas Lillard . . . . . Assistant Director,
*                                     Academic Computing
* * * * *

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BENCHMARKS is the Computing Center newsletter aimed at the NTSU academic community. A benchmark is a point of reference from which measurements of any sort are made, and that name was chosen to symbolize the intent of this publication - to provide a point of reference for the users of the North Texas State University computing facilities. BENCHMARKS was created to provide a channel of communications between the NTSU Computing Center and its users - a channel, hopefully, that will flow both ways, enabling both the users and the Computing Center staff to gain new insights into the ever changing world of academic computing.


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BENCHMARKS SPSS SUPPLEMENT

The following is a list of new or modified SPSS conventions, functions, and procedures for Version 8. Following each keyword description is a brief statement of changes and/or additions that have occurred. This is not intended to be a complete explanation, merely a reference, and the user should refer to the page number(s) that appears after each description for a more detailed explanation. The page numbers refer to the SPSS UPDATE manual for Releases 7 and 8. When release 8.1 is indicated in the reference, the change/addition is not documented in the update manual.

NEW CONVENTIONS, FUNCTIONS, AND PROCEDURES

1. ANOVA: With Release 8.1, ANOVA will not compute sums of square and mean squares for one case per cell designs in the absence of Option 3.
2. DATA DEFINITION AND TRANSFORMATION CONTROL CARDS: The limit of 250 symbols on [*]SELECT IF,MISSING VALUES,ASSIGN MISSING, and PRINT FORMATS cards no longer applies in Release 8.1. The limit is now related to the amount of workspace available for storage of the symbols as they are being parsed.
3. END INPUT DATA: It is now possible to specify N OF CASES UNKNOWN when reading raw data with INPUT MEDIUM CARD. The beginning of the raw data is indicated by the READ INPUT DATA card, as in the past, and the end of the raw data is indicated by an END INPUT DATA card placed after the last data card and before the next (if there is one) SPSS control card. The END INPUT DATA can be used only when the input medium is cards. If there is more than one card per case, the user should supply as many END INPUT DATA cards as there are cards/cases. The N OF CASES card is optioned if the END INPUT DATA card is used, unless only part of the input file is to be used. (See INPUT MEDIUM at N OF CASES in the Changes Section.) (Page 174)
4. FACTOR: NFACTORS and MINEIGEN on Release 8.1 can now be used to control the number of factors extracted with image factoring.
5. FISHERS EXACT TEST: With Release 8.1, SPSS prints a two-tailed test of significance for this statistic.
6. Keyword THRU: On Release 8.1, the keyword TO may not be used in place of the keyword THRU wherever THRU is called for.
7. [*]LAG: SPSS now provides a LAG control card for creating lagged variables. (Page 167)
8. LIST ERRORS: The LIST ERRORS card placed anywhere within the control deck except within a set of cards calling for a procedure or after a REORDER VARS or SAVE FILE card. This card produces a complete list of SPSS error messages requiring approximately 1150 printed lines. (Page 219)
9. MULT RESPONSE: The MULT RESPONSE procedure provides a mechanism for the analysis of multiple response items. Two types of output are provided: frequency tables similar to those produced by the integer version of FREQUENCIES and m-way tables similar to those produced by the integer version of CROSS TABS. (Pages 99-109). With Release 8.1, MULT RESPONSE will produce tables of groups with groups with pair variables between the groups, rather than pool all variables.
10. NPAR TESTS: The following nonparametric tests are available through NPAR TESTS: Chi-square, Kolmogorov-Smirnov, Runs, McNemar, Sign, Wilcoxon, Cochran, Friedman, Median, Mann-Whitney, Wald-Wolfowitz, Moses and Kruskal-Wallis. (Pages 66-98)
11. RELIABILITY: Subprogram RELIABILITY provides a means for evaluating multiple-item additive scales through the computation of "widely recognized coefficients of reliability." It will also supply basic summary statistics, including item means, standard deviations, inter-item covariance and correlation matrices, scale means, and item-to-scale correlations. RELIABILITY will also perform a repeated measures design analysis of variance, a two-way factorial ANOVA with one observation per cell, Tukey's test for additivity, Hotelling's T-squared for equality of means in repeated measures designs, and Friedman's two-way analysis of variance on ranks. (Pages 110-144)
12. REPORT: REPORT is a flexible format report generator that will produce case listings and aggregated summary statistics in a format controlled by the user. (Pages 1-37)

13. SEED: The SEED card used in conjunction with the SAMPLE card creates a reproducible random sample from a seed. The user may supply the seed, or, if keyword PRINT is entered, it will be generated by the system and printed. (Page 158) With Release 8.1, the first random number drawn is no longer periodically related to the time of day.
14. SURVIVAL: The SURVIVAL procedures produces life tables, graphs of survival functions, and comparisons of the survival performance of various subgroups in the sample. (Pages 38-65)

CHANGES IN OLD CONVENTIONS, FUNCTIONS, AND PROCEDURES

1. AGGREGATE: Skewness and kurtosis are now calculated as Fisher's G statistics. All AGGSTATS are now computed in double precision except MIN and MAX. (Page 213)
2. ANOVA: Option 9 has been revised to generate dummy variables of -1, 0, and +1. Statistic 3 will cause a means and counts table to be printed. (Pages 206-208)
3. BREAKDOWN: Double precision arithmetic is now used to accumulate sums of squares. (Page 214)
4. CANCORR: The number of canonical variates is no longer limited to five. All canonical correlations are now printed and degenerate correlations are computed correctly. The formula for the computation of chi-square has been corrected. (Page 215)
5. [*]COMPUTE: Two new functions, the NORMAL function and the UNIFORM function have been added to the [*]COMPUTE repertoire. The NORMAL function generates a normally distributed variable with a mean of 0. The user must request the standard deviation for the variable. The UNIFORM function creates a uniformly distributed variable. The user must specify the upper limit, the lower limit is 0. (Pages 160-61)
6. CONDESCRIPTIVE: An additional statistic, 12, is now available, which gives the sum of a variable over all cases. New formulas for skewness and kurtosis have also been implemented. (Pages 215-216)
7. CROSSTABS: Options 10, 11, and 12 have been added along with statistic 12. Option 10 outputs non-empty cell contents, option 11 outputs all cell contents, and option 12 suppresses printed output. Statistic 12 calls for a Pearson's product moment correlation to be completed. Fewer restrictions are now applied in integer mode. (Pages 200-05)
8. DISCRIMINANT: DISCRIMINANT in Release 8 is a completely new subprogram. All DISCRIMINANT specifications listed in the SPSS manual, second edition, have been implemented with a few minor alterations. A new parameter, SELECT=, designed primarily to allow automatic computations of unbiased error estimates, has been added. Backward stepwise inclusion is now available, and stepwise output and inclusion methods have also been altered. (Pages 184-199)
9. DO REPEAT: The DO REPEAT facility is now able to handle and generate constants. Constants may now appear in the substitution list for any stand-in variable just as variable names are used. DO REPEAT can now also generate consecutive integer constants using a form of the TO convention. There have also been some changes in the limitations for DO REPEAT:
 - (a) The number of stand-in variables which may be defined is now limited only by the available workspace.
 - (b) The formula to calculate the number of bytes of workspace required by DO REPEAT has changed.
 - (c) The maximum number of elements in any single statement between DO REPEAT and END REPEAT is now 250. (Page 165)
10. FACTOR: The accuracy of computation of standard deviations and correlations has been improved, slowing the procedure down when listwise or pairwise deletion of missing cases is used. (Page 216)
11. FINISH: The FINISH card is now optional. (Page 216)
12. FREQUENCIES: New formulas for the computation of skewness and kurtosis are now in effect. FREQUENCIES in general mode now detects rounding or truncation errors due to large or non-integer weights. Three new table-ordering options have been added, options 10, 11, 12. Option 10 prints tables in descending order of values; option 11 prints tables in descending order of frequency; and option 12 prints tables in ascending order of frequency. (Pages 216-17).
13. GET ARCHIVE: GET ARCHIVE will read files produced by SPSSH releases 6 and 6.01 with the use of option 1. If a file was created with any other release, this option must be omitted or an error message will be printed and processing terminated. (Page 218)
14. [*]IF: An equal sign (=) may now be substituted for the keyword "EQ" in relational expressions. (Page 173)

15. INPUT FORMAT: SPSS now has an extended format facility so that files which contain binary, packed decimal, zoned decimal or floating point data can be processed. (Pages 176-77)
16. INPUT MEDIUM: The default for INPUT MEDIUM is CARD. If the raw data are on tape or disk, INPUT MEDIUM must be specified, but N OF CASES and READ INPUT DATA or READ MATRIX are not needed. However, if the data are on cards, the INPUT MEDIUM card may be omitted along with the N OF CASES card, but a READ INPUT DATA card must be placed directly in front of the data deck and an END INPUT DATA card directly behind it. (Page 175)
17. LIST FILE INFO: SPSS now checks for invalid keywords on the LIST FILE INFO card. (Page 219)
18. MISSING VALUES: An optional specification of missing values has been implemented to conform to the OSIRIS convention for missing values. Missing values specified on OSIRIS data files are also now treated in SPSS as they are in OSIRIS. (Page 220)
19. N OF CASES: The N OF CASES card is now optional with raw data input. If it is omitted UNKNOWN is assumed. The only time it must be used is when the N is used to calculate tests of significance for procedures using matrix input which itself does not require group counts or when SPSS is restricted to reading the first N cases of a larger file. (Pages 174, 176)
20. NONPAR CORR: The performance of the NONPAR CORR subprogram has been substantially improved by the introduction of an advanced sorting algorithm, and a new option, 7, has been added. When option 7 is in effect, a random sample of cases is selected when there is not enough space for all cases. (Page 221-222)
21. NUMBERED: The keyword YES is no longer required in the specification field on the NUMBERED card. (Page 222)
22. ONEWAY: Option 10 is now available to use the harmonic mean for all groups in range tests, and, under certain conditions, multiple comparisons are automatically performed. (Pages 209-12)
23. OSIRIS VARS: OSIRIS VARS no longer prints a dictionary of the variables extracted from the OSIRIS file. This information can be printed with LIST FILE INFO. (Page 176).
24. PAGESIZE: If the keyword NOEJECT is used, logical page numbers will be printed, which will permit the use of the index options for FREQUENCIES and CROSSTABS. (Page 223)
25. RAW OUTPUT UNIT: The default DCB characteristics for the standard raw output unit (FT09F001) have been changed to RECFM=U,BLKSIZE=80. (Page 225)
26. READ INPUT DATA: The READ INPUT DATA card is now optional unless the INPUT MEDIUM is CARD. (Page 175)
27. READ MATRIX: The READ MATRIX card is now optional unless the INPUT MEDIUM is CARD (Page 175, for changes in matrix input for DISCRIMINANT, Page 129, RELIABILITY, Page 128).
28. REGRESSION: Inclusion level 1 is now the default if the list of independent variables in a REGRESSION- specification does not end with one. (Page 223)
29. [*]SAMPLE: Besides using the SAMPLE card to extract a random sample of data, the functions UNIFORM and NORMAL are now available to generate random values from the named distributions. (Page 157)
30. SAVE ARCHIVE: ARCHIVE file labels specified on the SAVE ARCHIVE card are not reproduced properly on output. Numbers are reproduced as arbitrary special characters. If the user omits the new file name on the SAVE ARCHIVE card and enters the archive file name and label on a FILE NAME card at the beginning of the run, the archive file will be saved with the name and label specified. (Page 223)
31. SAVE FILE: The last 200 value labels declared per variable are now saved. (Page 223)
32. SCATTERGRAM: Option 8 has been changed so that if there is not enough core storage space to process all cases, a plot will be produced containing as many randomly selected cases as possible. (Page 223)
33. [*]SELECT IF: SELECT IF and *SELECT IF are now executed in sequence. If more than one SELECT IF card appears in a deck, or if more than one *SELECT IF appears before a procedure, SPSS connects them with AND. That is, a case must satisfy the conditions specified on all the SELECT IF and/or *SELECT IF cards before it can be selected. (Page 160)

34. SORT CASES: SORT CASES is no longer connected with SAVE FILE, and files can be sorted before any procedure. Alphanumeric variables are now sorted correctly, and up to 64 variables may be named as sort keys. SORT CASES can also group cases and define subfiles automatically, and the original sequence of cases can be preserved within sorted groups. (Pages 180-83)
35. T-TEST: Subprogram T-Test has been modified to perform and store all computations in double precision. (Page 224)
36. WRITE CASES: A repetition factor in the WRITE CASES format may not exceed 255.

KNOWN ERRORS IN RELEASE 8.1

The following is a list of errors known to exist in SPSS Release 8.1. This list is being published so that users may be alerted to possible discrepancies in their output.

BREAKDOWN:

- (a) Integer mode, CROSSBREAK FACILITY ONLY. The Chi-square warning message for cells with expected frequencies less than 5 is unreliable. It is not always printed when it should be, and the counts and minimum values listed are not always accurate.
- (b) Option 2 (Exclude cases with missing values on the dependent variable) does not work for CROSSBREAK. Cases with missing values on the dependent variable are included in the calculation of the statistics.
- (c) CROSSBREAK. There is a maximum of 200 non-empty rows and 200 non-empty columns allowed. If these maxima are exceeded, a non-fatal message is printed and processing continues. The manuals do not document this limitation.

COMPUTE and IF:

An expression of the form $Y - 2 ** Z$ is parsed incorrectly as $Y + (-2) ** Z$. The result is correct if Z is odd, but incorrect if Z is even. Only expressions exactly like this are affected: Those where a constant to a power are subtracted from a variable or an expression. Use parentheses to force correct parsing: $Y - (2 ** Z)$.

MULT RESPONSE:

- (a) All reported frequencies have minima of 1.
- (b) MULT RESPONSE contains no check for alphanumeric variables.

RELIABILITY:

Friedman's test (Option 15) cannot be computed by the default computing method because that code skips scales with zero variance, which occur whenever the data are ranks. When Option 15 is selected, Option 14 should be selected as well, to force the alternative computing method.

REPORT:

REPORT loses dummy or string variables in SUMMARY statements.

SAVE ARCHIVE/LIST ARCHINFO:

SAVE ARCHIVE or LIST ARCHINFO will fail if DOCUMENT precedes GET ARCHIVE in the run.

VALUE LABELS:

If a variable name is omitted on the VALUE LABELS card, the value labels of the missing variable destroy the value labels of the previously defined variable instead of generating a syntax error.

WRITE FILEINFO/LIST FILEINFO:

WRITE FILEINFO and LIST FILEINFO produce incorrect N OF CASES values if they are the first procedure and if N OF CASES is UNKNOWN.